

AMENDMENT

This listing of claims will serve to replace all prior versions and listings of claims in the present application:

1. (Currently amended): A process for the removal of contaminants from a surface of a substrate requiring precision cleaning, comprising: (a) applying at least one fluid to the substrate surface, the fluid selected from the group consisting of a ~~high-vapor-pressure liquid~~ having a vapor pressure greater than 5 KPa at 25°C, a reactive gas of the type which reacts with the contaminants, and vapor of a reactive liquid of the type which reacts with the contaminants; and (b) cryogenically cleaning the substrate surface ~~of the substrate~~ with a cryogenic stream.
2. (Previously amended): The process of claim 1 wherein (a) and (b) are carried out simultaneously.
3. (Previously amended): The process of claim 1 wherein (a) and (b) are carried out sequentially.
4. (Currently amended): The process of claim 1 wherein the at least one fluid is ~~a high-vapor-pressure~~ the liquid selected from the group consisting of ethanol, acetone, ethanol-acetone mixtures, isopropyl alcohol, methanol, methyl formate, methyl iodide, ethyl bromide, acetonitrile, ethyl chloride, pyrrolidine, tetrahydrofuran and mixtures thereof.
5. (Currently amended): The process of claim 1 wherein the at least one fluid is ~~a~~ the vapor ~~of a reactive liquid~~ selected from the group of liquids consisting of ethanol, acetone, ethanol-acetone mixtures, isopropyl alcohol, methanol, methyl formate, methyl iodide, ethyl bromide, and mixtures thereof.

6. (Currently amended): The process of claim 1 wherein the at least one fluid is a the reactive gas selected from the group consisting of ozone, water vapor, hydrogen, nitrogen, nitrogen oxides, nitrogen trifluoride, trifluoride, helium, argon, neon, sulfur trioxide, oxygen, fluorine, fluorocarbon gases and mixtures thereof.
7. (Currently amended): The process of claim 1 wherein the at least one fluid is a the reactive gas or the vapor selected from the group consisting of isopropyl alcohol, ethanol-acetone mixtures, methanol, ozone, water vapor, nitrogen trifluoride, trifluoride, sulfur trioxide, oxygen, fluorine and fluorocarbon gases, and mixtures thereof.
8. (Currently amended): The process of claim 1 wherein the at least one fluid remains in contact with the surface for up to 10 minutes prior to the ~~eryogenic~~-cleaning.
9. (Currently amended): The process of claim 8 wherein the at least one fluid remains in contact with the surface for less than 2 minutes prior to the ~~eryogenic~~-cleaning.
10. (Original): The process of claim 1 wherein the contaminants are less than 0.76 μm in size.
11. Canceled.
12. (Currently amended): The process of claim 1 wherein the ~~high-vapor pressure~~ liquid has a ~~vapor pressure greater than about 5 kPa at 25°C,~~ and a freezing point below about -50°C.
13. (Currently amended): The process of claim 1 wherein the ~~high-vapor pressure~~ liquid has a dipole moment of greater than about 1.5 D.

- 14.(Currently amended): The process of claim 1 wherein the high-vapor pressure liquid remains on the surface in a layer of at least 5 Å Å (angstroms) for less than 10 minutes and preferably less than 2 minutes prior to the cryogenic cleaning with the cryogenic stream.
- 15.(Currently amended): The process of claim 4 further comprising the high vapor-pressure liquid removing bulk water from the substrate surface.
- 16.(Currently amended): The process of claim 1 wherein the substrate surface is selected from a semiconductor, metal ~~or~~ and dielectric film.
- 17.(Currently amended): The process of claim 1 wherein the at least one fluid is a selected from the reactive gas ~~or~~ and the vapor which reacts with the contaminants on the substrate surface to form a volatile gaseous byproduct; and further comprising: maintaining the reactive gas or the vapor in contact with the substrate surface for up to 20 minutes, and removing the gaseous byproduct prior to the cryogenic cleaning.
- 18.(Currently amended): The process of claim 17 wherein the reactive gas or vapor is introduced in a chamber containing the substrate, ~~under low at~~ pressure below atmosphere pressure and/or at temperatures of up to 200°C.
- 19.(Currently amended): The process of claim 18 wherein removing the byproduct comprises purging the chamber with a gas selected from nitrogen ~~or~~ and clean dry air.
- 20.(Currently amended): The process of claim 17 wherein the ~~reactive gas or~~ vapor at least one fluid is applied to the substrate surface in the presence of a free radical initiator selected from ultraviolet light, x-ray, laser, corona discharge and plasma to generate reactive chemical byproducts from the

~~reactive gas or vapour and~~ species to increase reactivity with the
contaminants.

21. Canceled.